The Genus *Anisops* (Hemiptera: Notonectidae) in Ceylon

BY

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(*With three plates*)

Introduction

Anisops is the commonest genus of the Notonectidae in south-east Asia. In Ceylon it is very widespread, occurring chiefly in the low country. In spite of its commonness it has been recorded only on a few occasions. Distant (1906, 1911) mentioned one species '*Anisops fieberi*' and described a new species *Anisops ali*. Lundblad (1933) mentions *Anisops ali* Distant and *Anisops nasuta* Fieb. as occurring in Ceylon. Brooks (1951) records one species *Anisops breddini* Kirk. from Ceylon. Fernando (1959, 1961a) recorded three species, *Anisops batillifrons* Lundb., *A. crinita* Brooks, and *A. nivea* (Fabr.). Mendis & Fernando (1962) have mentioned eight species from Ceylon. The present paper is a report on material collected by one of the authors (C.H.F.) in Ceylon. A short account of the genus *Anisops* with keys to the genera of Notonectidae and the Ceylonese species of *Anisops* are also included. Brief mention is made of the biology of *Anisops* in south-east Asia, especially its occurrence at artificial lights and in isolated habitats.

Biology

A large number of species of *Anisops* occur in south-east Asia. They constitute the most abundant species among the large back-swimmers (Notonectidae). They live chiefly in the shallow water of ponds and the edges of lakes. Sometimes they are also found in slow-running streams. They are predaceous in habits and feed largely on small arthropods. In south-east Asia they are numbered among the important enemies of mosquito larvae (Dempwolff, 1904;

Hinman, 1934; and Laird, 1956). Some species are extremely mobile and fly from pond to pond. They have been recorded in isolated habitats in many taxonomic works and also by Laird (1956) and Fernando (1959). They sometimes fly to artificial lights (Brooks, 1951; and Fernando 1961a, 1961b). Hale (1924) records large numbers of *Anisops* flying off from a lake early in the morning. Fernando (1961a) recorded two species, *Anisops batillifrons* and *A. nivea*, flying in the morning in Ceylon. It is likely that *Anisops* fly mainly at dawn.

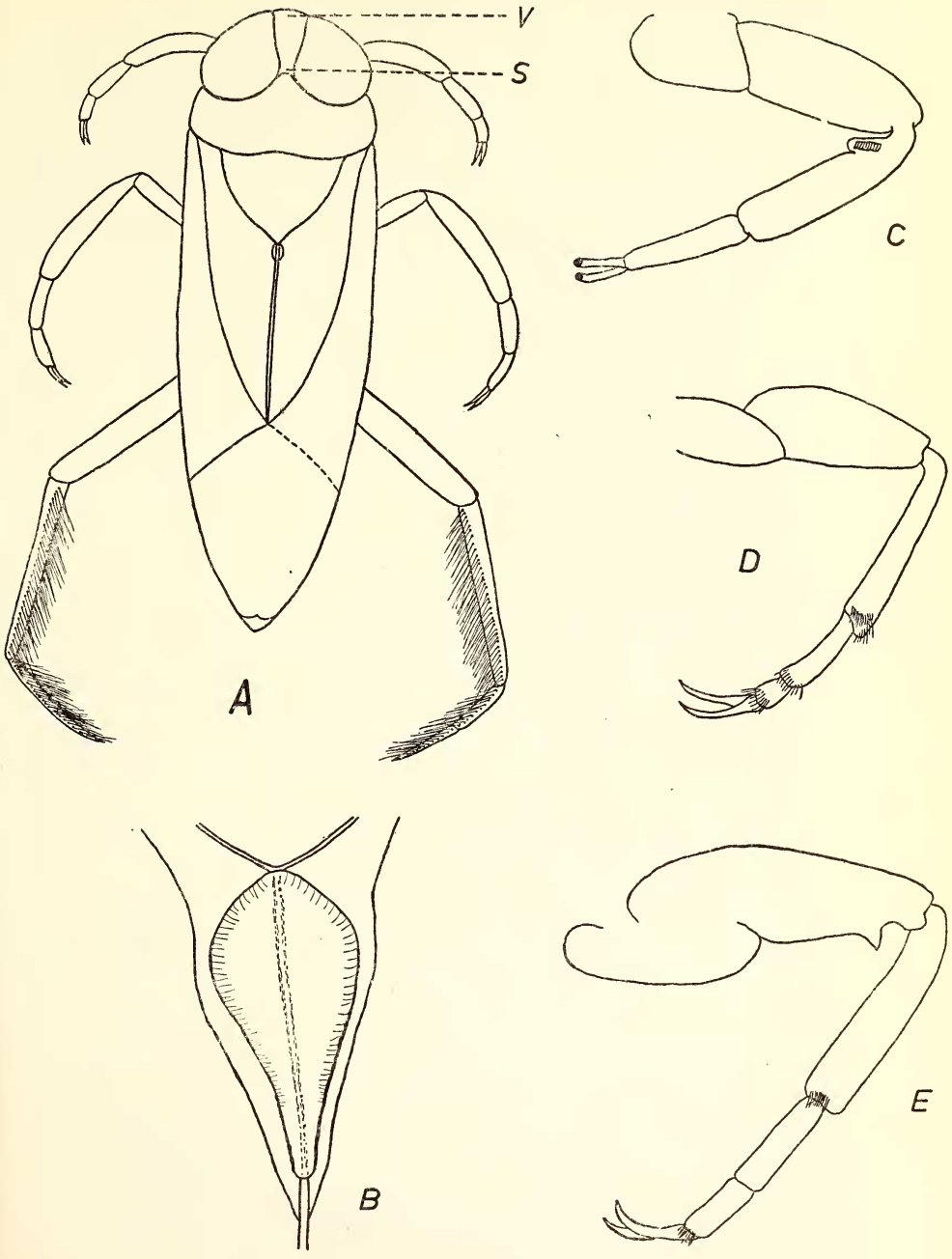
Eggs are inserted into the soft parts of plants (stems and leaves). Stridulation has been recorded in some species. Little is known of the biology of *Anisops* in south-east Asia. The only detailed accounts are those of Hale (1923) in Australia and Poisson (1926) in Africa.

Taxonomy

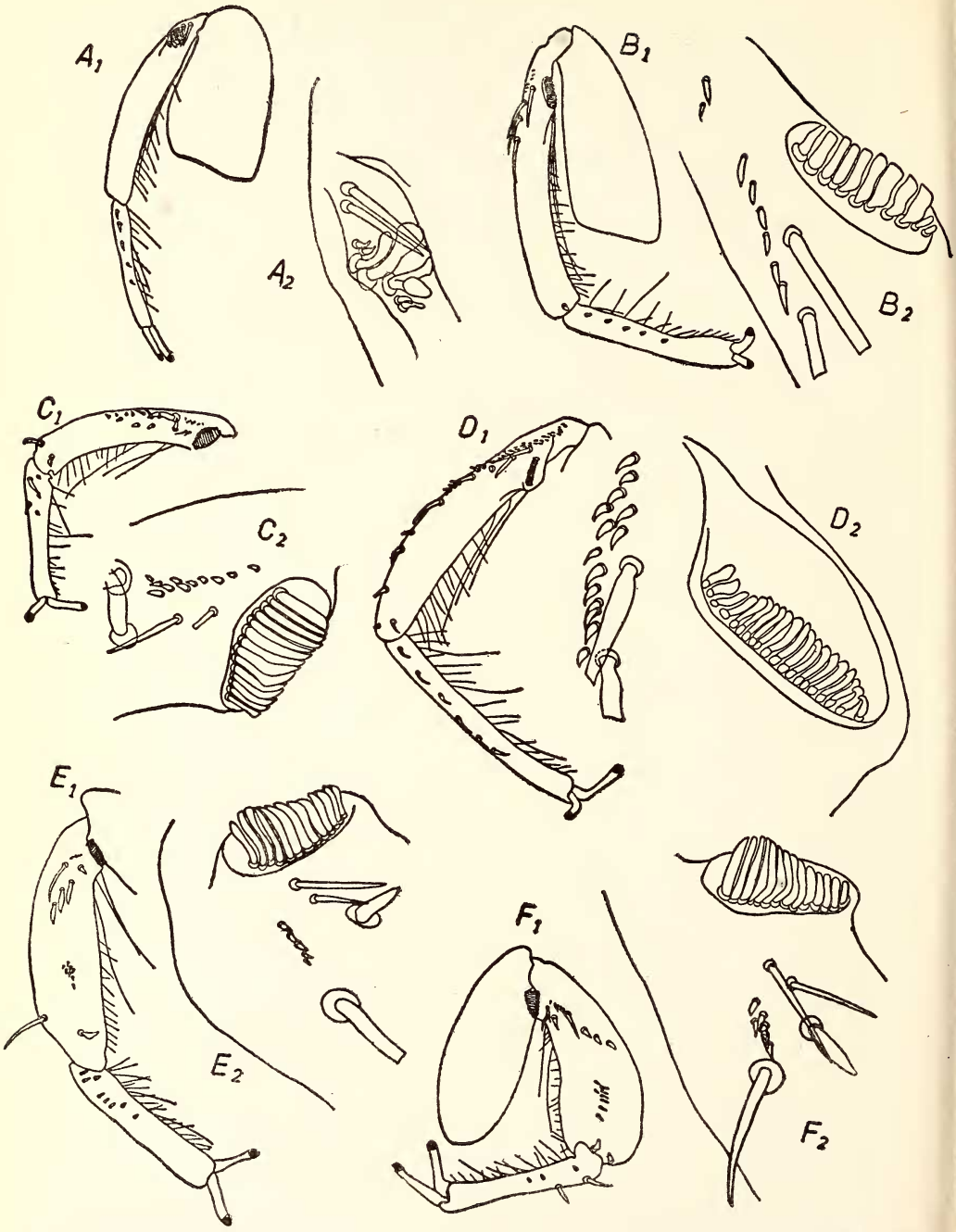
Whilst the generic diagnosis of *Anisops* has proved relatively easy, specific diagnosis was based on unsatisfactory characters like colour and size. This led to considerable confusion until Brooks (1951) revised the genus including all species so far described. He made use of the chaetotaxy of the fore-legs of the male, the shape of the rostral prong and the facial tubercle which were used by earlier workers. He also utilised the shape of the labrum and the femur of the first leg of the male as additional features to be relied on for specific diagnosis. In the present paper we have compared our material with the excellent descriptions of Brooks (1951) and used easily observable characters for illustration to make diagnosis accurate and easy for the Ceylonese species. Since Brooks (1951) has given detailed descriptions of all the species we have recorded, we have given only the important diagnostic features for each species.

The Notonectidae are represented in Ceylon by three genera: *Anisops, Nychia,* and *Enithares.* A key to the separation of these is given below:

1. Hemelytral commissure with a hair-lined pit (Plate I, A-B) .. *Anisops*
   Hemelytral commissure without a hair-lined pit .. 2
2. Femur of middle leg with antapical protuberance (Plate I, E) ..
   Eyes not holoptic .. .. *Enithares*
   Femur of middle leg without antapical protuberance (Plate I, D)
   Eyes holoptic .. .. *Nychia*



A. Dorsal view (diagrammatic) of *Anisops* (s=synthlipsis, v=vertex); B. Enlarged view of hair-lined pit of *Anisops*; C. Diagrammatic drawing of fore-leg of male *Anisops*; D. Diagrammatic drawing of middle leg of male *Nychia*; E. Diagrammatic drawing of middle leg of *Enithares*.



The chaetotaxy of fore-legs of the males of: A_1 & A_2. *Anisops breddini*; B_1 & B_2. *Anisops exigera*; C_1 & C_2. *Anisops nivea*; D_1 & D_2. *Anisops barbata*; E_1 & E_2. *Anisops bouvieri*; F_1 & F_2. *Anisops extendofrons.*

The genus *Anisops* is further easily recognised by the one-segmented tarsi of the male fore-legs. These bear bluntly rounded tarsal claws. There is also a stridulatory comb on each fore-leg (Plate I, C). A generalised drawing of *Anisops* is shown in Plate I, A.

Ceylonese Species

In the present paper eight species are recognized as being found in Ceylon, namely *Anisops ali* Distant, *A. batillifrons* Lundb., *A. bouvieri* Kirk., *A. extendofrons* Brooks, *A. barbata* Brooks, *A. exigera* Horv., *A. nivea* (Fabr.), and *A. breddini* Kirk.

Anisops ali Distant

No specimens of this species were available to us. *Anisops ali* is known only from the female and there is the possibility that it is the synonym of *Anisops allaudi* Poisson[1] (personal communication by I. Lansbury, Hope Department of Entomology, Oxford).

The type locality of this species is Diyatalawa and a brief description is given by Distant (1911) which has been transcribed by Brooks (1951).

Anisops batillifrons Lundb.

The following material was available to us: 3 males, Kadahapoda, Kurunegala District, 29-7-57; 5 females, 22nd mile Kurunegala-Maho Road, 14-7-57; 1 male, 5 females, Wilpattu 23-6-52; 3 males, 5 females, Habarana, 7-3-57; 1 male, 3 females, Divulapitiya, Nattandiya, 28-7-57; 3 males, 2 females, Watupitiwela, 9-11-56; 5 males, 6 females, Thunmodera, Nattandiya, 21-6-57; 2 males, Kotadeniya, 13-10-57; 1 male, 1 female, Kiniyama, 3-5-58; and 3 females, Nugegoda, 16-11-57.

The male measures 5.2-6.8[2] in length and 1.3-3.1 in breadth. The females are 5.5-6.5 long and 1.5-1.9 broad. This species is easily the commonest in the collections we have examined. It is easily recognized by the short cephalic projection (Plate III, E), and the chaetotaxy of the male fore-leg (Plate III, C-D).

Anisops batillifrons has been recorded in Ceylon by Fernando (1959, 1961a). It is a widely distributed species occurring in

[1] From Reunion I. Eds.
[2] All measurements in mm.

Formosa, Hainan, China, Burma, Assam, India, Philippines, Okinawa, and Ceylon. It is likely that earlier records of the species were confused with those of *Anisops bouvieri*, the females of which are indistinguishable from *A. batillifrons*, and *A. nasuta* which it resembles superficially.

Anisops batillifrons flies readily and has been recorded in isolated habitats by Fernando (1959) and at light (Fernando, 1961a). It is often found in paddy fields (Fernando, 1959).

Anisops bouvieri Kirk

Only a single male from Mandativu, Jaffna Peninsula, 5-12-57, was available for study besides a pair of mounted fore-legs of a male. We have also measured a female collected in Malaya.

The male measures 6.8 including the cephalic projection and is 1.9 broad. The female is 6.5 long and 2.0 broad.

Though the females of *Anisops bouvieri* and *A. batillifrons* are indistinguishable, the males of *A. bouvieri* can be easily separated from *A. batillifrons* by the longer, acuminate cephalic projection (Plate III, F), and the chaetotaxy of the male fore-legs (Plate II, E_1-E_2).

Anisops bouvieri is widely distributed in south-east Asia. It occurs in New Guinea, Malaya, Siam, Burma, Assam, India, and Ceylon. It is a very mobile species and has been recorded at light in India by Brooks (1951).

Anisops extendofrons Brooks

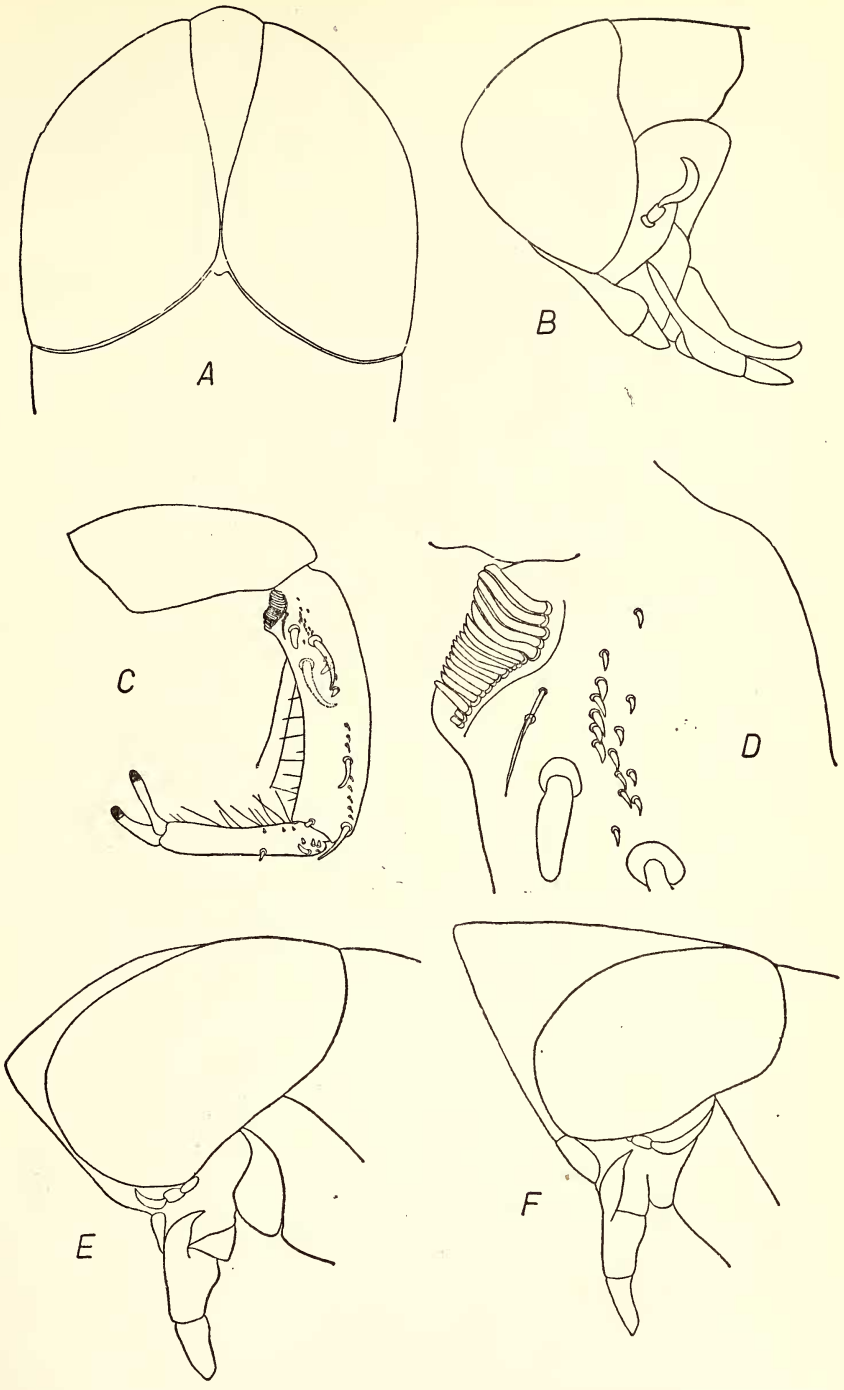
Only a pair of mounted fore-legs of the male was available from Ceylon. The specimen was collected from Ambalantota on 22-5-57. According to Brooks (1951) the male measures 6.4-6.8 in length and 1.5-1.7 in breadth. The females are 6.0 in length and 1.8 in breadth.

This species resembles *Anisops bouvieri* very closely and the males have a long cephalic projection. It can however be distinguished from *A. bouvieri* by the chaetotaxy of the male fore-legs (Plate II, F_1-F_2).

Anisops extendofrons has so far been recorded only from two localities in India (Brooks, 1951). This is the first record of this species from Ceylon, except the mention of its occurrence by Mendis & Fernando (1962).

Anisops barbata Brooks

One male and one female of this species was available to us besides a pair of mounted fore-legs of the male. The former were



A-B. *Anisops breddini*: A. Dorsal view of head to show holoptic eyes; B. Profile of head. C-E. *Anisops batillifrons*: C. Chaetotaxy of male fore-leg; D. Enlarged view of stridulatory comb; E. Profile of head. F. *Anisops bouvieri*: Profile of head.